



The Use of Blended Learning Based Flipped Classroom towards Students' Reading Comprehension Achievement and Perspectives

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Abstract: The study conducted a profound exploration on the potential impacts of a blended learning-based flipped classroom method on students' reading comprehension and their perception towards it. The methodology used a quantitative quasi-experimental approach with purposive sampling in a state senior high school in Palembang. The process of collecting data involved the utilization of questionnaires, post-tests, and pre-tests. Either experimental and control class has 25 students. The test's reliability and validity were thoroughly examined through the employment of the Split-Half technique as well as the Aiken formula. Furthermore, in an effort to establish dependability for the questionnaire, Pearson Correlation testing methods were utilized. A comprehensive data analysis covered broad statistical areas including application of Shapiro-Wilk procedure, Levene Statistics test evaluating homogeneity characteristics, deployment of independent samples t-test and incorporation of Cohen's *d* in hypothesis validation procedures. Post intervention results from experimental group significantly indicated marked improvements in reading comprehension following hypothesis assessment. The alternative hypothesis (H_a) was thereby substantiated, leading to the rejection of the null hypothesis (H_0). Additionally, students perceive the blended learning-based flipped classroom as an enjoyable teaching approach that enhances their engagement in the learning process and aids improvement in areas that require attention. These findings imply that implementing the blended learning-based flipped classroom could be a valuable resource for English teachers, offering advantages to students such as improved accessibility and readiness for reading comprehension learning.

Keywords: Flipped Classroom, Blended Learning, Reading Comprehension

1. Introduction

Numerous challenges emerge during learning to read at school, the main ones being related to teaching and learning methods. The issue lies in the fact that instructional and learning methods employing a teacher-centered approach are not engaging for students. Because of the insufficient incorporation of multimedia and the absence of contemporary technology in the educational process, students frequently encounter challenges and lose motivation for learning. Students who are having difficulty learning can

benefit from using learning technologies such as smartphones, computers, and educational websites [1]. Furthermore, because significant time is allocated to teacher-led teaching, the teacher-centric nature of the classroom limits the time available for students to engage in practical, in-class exercises. Teachers should use methods designed to address these particular concerns in order to overcome these challenges. To encourage students to engage in a wide range of educational activities, it is imperative to provide them with

engaging and exciting learning experiences.

The blended learning-based flipped classroom method does away with conventional lectures, instead providing students with pre-class learning materials like video lectures, e-books, and presentation slides to convey the same content. Because they are able to independently research a range of topics outside of the classroom, this promotes a deeper comprehension of the material. During class, students work in groups under the direction of the teacher, discussing and applying the information that has been presented in earlier sessions. Peer interactions in the classroom enhance this type of learning experience even more.

Other studies explore the benefits of combining online and in-person learning in the blended learning-based flipped classroom method. This includes better student achievement, results, active participation, and growth of higher-order thinking abilities [2]. In this teaching method, student learning is improved through active teamwork with peers, promoting high-quality active learning opportunities [2] [3]. The adoption of blended learning, especially through the flipped classroom approach, has demonstrated significant improvements in students' critical and creative thinking abilities. This is achieved by fostering creativity in generating multiple solutions for assignments, promoting adaptability in exploring beyond established knowledge, and encouraging the creation of original ideas [4]. In addition, recent research demonstrates that the employment of a blended learning based flipped classroom method grants teachers increased adaptability in formulating instructional strategies. This not only enhances educational outcomes but also significantly augments students' analytical prowess and problem-solving abilities [5]. When implemented correctly, this strategy has the potential to significantly increase student motivation and contribute to notable achievements in effective learning outcomes [6]. Undoubtedly, this holds significant potential to modulate their perspectives, thereby fostering an eagerness for proactive involvement in the model and optimization of learning results [7] [8] [9] [10]. In contrast, this study centers on enhancing students' reading comprehension achievement and investigating their viewpoints by integrating the blended learning-based flipped classroom into the reading comprehension course. In traditional classrooms, teachers frequently assign reading for students to complete at home, followed by in-class discussions—a structure that corresponds to a flipped classroom [11]. However, the method has unique characteristics when used in blended learning. In this method, students watch video lectures outside of the classroom, allowing for increased time dedicated to active learning and hands-on activities during class [12] [13]. While the general concept of the method typically entails students watching or listening to lessons at home and engaging in 'homework' activities during class [14].

Various interpretations exist for online learning. Initially, video lectures were developed to offer curriculum accessibility to individuals residing at a distance from educational institutions. Teachers soon realized that videos

proved beneficial not only for remote students but also for those physically attending lectures [15] [16]. Over the past decade, online classes, especially at the college level, have gained significant popularity. Nonetheless, there is often voiced a recurrent concern among students about the perceived dearth of interaction and communication prevalent in completely online courses [17] [18]. Conversely, the blended learning-centered flipped classroom method involves online learning via a series of video lectures, supplemented by in-person classroom discussions and individualized assistance. Therefore, the blended learning-based flipped classroom method is different from conventional online education [19] [20] [21]. Traditional classroom lectures are typically delivered at the same rate to all students. While teachers may make adjustments based on feedback, some students may perceive the pace to be too fast, while others may perceive it to be too slow. In contrast, video lectures in the blended learning-based flipped classroom method allow students to fast forward through sections they already know or pause and rewind to review topics that require more processing time [22]. Videos allow for the segmentation of lectures into smaller units, which differs from traditional instruction, which frequently presents a large volume of content in a single session [23] [24].

The blended learning based flipped classroom method offers a departure from traditional learning methods. In this model, teachers engage in face-to-face instruction after students independently or collaboratively study and comprehend the provided material outside of the classroom [25]. This method allows students to acquire knowledge through the learning procedure, which involves them independently investigating and examining information. Unlike traditional methods, the blended learning-based flipped classroom method entails assigning reinforcement tasks to be completed at home prior to the start of online class sessions [26].

Information technology systems are integrated into the educational process to provide online platforms that facilitate the flipped classroom method. This kind of teaching creates a classroom environment that stimulates students' ability to come up with original ideas. Students acquire direct knowledge through their analytical processes in the pursuit of understanding [27]. This aims to maintain alignment between students' comprehension and the explanations provided by the teachers [28]. This method actively motivates students to eagerly acquire knowledge, aligning more closely with the student-centered learning process [29] [30].

Integrating technology into digital teaching materials enhances students' effectiveness in completing assignments. With the availability of smartphones, students can now independently research topics of personal interest. Teachers hold in-person talks in the virtual classroom once assignments are finished. The use of technology enables students to address issues, formulate concepts, and actively participate in both individual and group learning. This method fosters active student engagement, time efficiency, and facilitates both classroom activities and learning [31]. In

2017, a thorough scientific investigation was conducted to evaluate the effects of blended learning based the flipped classroom method, on students studying English as a Foreign Language (EFL). The study critically examined alterations in these students' perceptions and evaluated potential enhancements in their reading comprehension abilities [32]. This study engaged fifty English as Foreign Language (EFL) students from an esteemed private language institution in Isfahan, Iran. The subjects were methodically divided into two groups, namely the experimental and control groups, ensuring equitable distribution. Data was meticulously collected through pre- and post-test evaluations. In addition to this objective measure of progress, participants' perceptions regarding the pedagogical approach were also assessed via a quantifiable survey instrument. The findings demonstrated how well this approach improved the participants' reading comprehension skills and generated favorable sentiments toward it. The treatment group's students concurred that the method had helped them in a variety of ways.

In Shiraz, Iran, two private language schools participated in a study. The goal of the study was to assess how well the blended learning-based flipped classroom method may enhance the reading comprehension skills of intermediate and upper-intermediate English as a foreign language (EFL) students. The reading comprehension tests were used both before and after by the researchers with a sample of one hundred students. The experimental and control groups performed significantly differently from one another, as evidenced by the results, with the treatment group outperforming the former. This suggests that the method was successful for enhancing reading comprehension. The findings also confirmed that intermediate-level students benefited more from the blended learning-based flipped classroom than their upper-intermediate counterparts. As a result, these findings provide English as a Foreign Language (EFL) teachers with insightful knowledge about how the blended learning-based flipped classroom method affects improving student learning [33].

In 2020, a study was carried out with the flipped classroom paradigm to incorporate blended learning and evaluated its efficacy in improving reading comprehension among a group of Thai English majors. The comparison between the reading comprehension of the experimental group, instructed through the blended learning-based flipped classroom method, and that of the control group, taught using conventional method, revealed a significant enhancement. The participants also voiced contentment with their FC learning experiences that were founded on blended learning. These studies indicate that depending only on reading strategies may be insufficient for enhancing students' reading abilities [34]. The FC method transforms a teacher-focused classroom into a student-focused one, thus aiding students in learning. Hence, the utilization of the blended learning-based flipped classroom method holds great importance in ESL/EFL education, as it extends the learning process beyond the

confines of the classroom [35].

Furthermore, an additional study was conducted utilizing the blended learning-based flipped classroom method, as previously described. They created a control group, two identical experimental groups, and one extra group using an experimental design. In the second course (2019–2020), one group received education using the blended learning-based flipped classroom method for three classes per week for eight weeks, while the other group received instruction using the traditional method. In the realm of reading comprehension, results have discernibly exhibited that the experimental group surpassed performance levels of their counterparts in the control group. This deviation was notably reflected within mean data comparisons between the two factions. The aforementioned disparities are attributed to differing academic experiences; specifically, the deployment of a blended learning-based flipped classroom method introduced to instruct students in our experimental set-up [36]. Previous research indicates that students have positive opinions about the blended learning-based flipped classroom method. They like this method because it allows them to watch lecture videos as part of their pre-class assignments, which helps them understand concepts better [37] [38] [39]. This model's flexibility allows students to study at any location and at any time, at their own pace. They can download videos or lecture materials, allowing them to pause, replay, or re-read content and facilitating self-paced learning. This learning model may also help students improve their communication skills.

The instructional method termed "blended learning-based flipped classroom" is gaining popularity in higher education in Norway as a replacement for traditional teaching methods [40] [41]. Students who engaged in the blended learning-based flipped classroom method and traditional lectures expressed a preference for the active learning environment facilitated by the blended learning-based flipped classroom method over traditional lectures. It was also found that they felt dedicated to their fellow students and were forming constructive bonds with both their peers and teachers. Students in the United Kingdom had similar reactions to blended learning-based FC, confirming these findings. Students appreciated the flexibility provided by this method, and while they initially faced adaptation challenges, their learning gradually improved [42] [43].

The subsequent research inquiries were formulated to fulfill the objectives of the study.

RQ1 : Does a noteworthy disparity exist in students' reading comprehension achievement between groups instructed using the blended learning-based flipped classroom method and those taught using traditional methods?

RQ2 : In their reading comprehension course, how do the students feel about incorporating the blended learning-based flipped classroom method?

2. Methodology

2.1. Design

The research incorporated a quantitative methodology, utilizing a quasi-experimental design. This methodology entails gathering numerical data or employing statistical techniques to answer research questions.

2.2. Participant

The study enlisted twelfth-grade students from four classes (XI A, XI B, XI C, and XI D) at SMA Negeri 5 Palembang during the academic year 2023–2024 as its participants. Two classes were chosen for the study, with one designated as the control group and the other as the experimental group. In this research, purposive sampling was used, in which the samples were chosen to reflect the population on the basis of pre-existing knowledge or subjective assessments.

2.3. Instruments

Tests and a questionnaire served as the researcher's main tools in this research. To assess students' perception of the blended learning-based flipped classroom method, three evaluation tools were employed: a questionnaire, a pre-test, and a post-test. The test comprised 40 objective-type questions while the questionnaire contained 30 closed-ended questions which solicited students' perspectives on utilizing a blended learning model in a flipped classroom context.

2.4. The test validity

The evaluation of the content validity for the employed instrument leveraged Aiken's V coefficient. Within the context of this study, a panel of five experts critically assessed content validity harnessing Aiken's V formula. The formula calculates the content validity index by considering expert assessments of how well an item represents the measured domain or construct.

2.5. The test reliability

The split-half technique was employed to evaluate the reliability of the test. This technique requires generating two scores for each participant by splitting the measures into two equivalent parts, followed by correlating the scores on those two halves. A higher correlation signifies greater reliability [44] [45]. The researcher can determine whether the two halves of a test evaluate the same characteristics or traits by looking at split-half reliability of the Spearman-Brown formula.

2.6. Validity and Reliability of Questionnaire

The questionnaire employs a 5-point Likert scale with five levels of agreement for each item. Prior to utilization, the questionnaires underwent validation and reliability testing using the Pearson Correlation test.

2.7. Procedure

Pre-test, post-test, and questionnaire responses from students on their reading comprehension served as the source of the data used in this investigation. The researcher used the following research methodologies in order to gather the data:

2.7.1. Descriptive statistics

In the descriptive statistics analysis, parameters like total number of participants (N), lowest and highest scores, average scores, and standard deviation were looked at. The pre-test results for the control group, the post-test results for the control group, the pre-test results for the experimental group, and the post-test results for the experimental group were the four sources from which these scores were produced.

2.7.2. Prerequisite analyses

Two tests must be performed as part of the necessary preliminary assessments: the homogeneity and normality analyses were used.

To analyze the normality test, the Shapiro-Wilk test is used which is more appropriate method for small sample sizes (<50 samples) to confirm whether the data fit into a normal distribution.

To assess homogeneity, Levene's test was utilized. Levene's test is used to conclude whether two populations have the same distribution.

2.7.3. Giving pre-test

The researchers initially conducted the pre-test before implementing the treatment for both the experimental and control groups.

2.7.4. Giving treatment

The study adhered to a five-step protocol. Initially, participants were divided into two groups: the experimental group and the control group. Each group underwent a pre-reading comprehension test. Subsequently, in the second step, the experimental group was tasked with completing online assignments and activities prior to class. In the third phase, the control group received conventional lectures from the teacher, while the experimental group participated in group discussions and activities. The fourth procedure was taking place after class, the control group worked in groups and finished homework. Finally, both groups completed a post-reading comprehension test in the fifth step. Additionally, the experimental group filled out a survey giving feedback on the blended learning-based flipped classroom method.

2.7.5. Giving post-test

Upon conclusion of the intervention, the researcher administered a post-test to both experimental and control groups. This test was meticulously crafted to assess any significant enhancement in students' reading comprehension achievement resulting from the incorporation of blended learning-based flipped classroom methods into their curriculum. Subsequently, the pre- and post-intervention measurements were subjected to a thorough evaluation by researchers aimed at verifying the credibility and accuracy of these respective data sets.

2.7.6. Distributing questionnaire

The questionnaire items were converted into a Google Form to enable smooth and efficient assessment. After that, all the questionnaire questions were sent out to the participants

through a WhatsApp group. When the questionnaire data was collected, it was moved and entered into IBM SPSS version 25 for examination.

2.8. Data Analysis

The collected data was utilized to evaluate differences in academic performance between the experimental and control groups. Various prerequisites, including obtaining descriptive statistics for pre- and post-test scores, ensuring normal distribution, and confirming homogeneity, were essential to validate the use of the independent samples t-test. Ultimately, the researchers utilized the independent samples t-test to determine the significance of discrepancies in reading comprehension abilities between the experimental and control groups.

To address the second research question, statistical techniques were applied to analyze the data collected from the survey questionnaire. In the questionnaire, participants indicated whether they concurred or disagreed with particular assertions. The questionnaire utilized a closed-format, which restricted responses to pre-defined choices and removed chances for extra feedback. The 30-item questionnaire prompted students to communicate their perspectives on the researcher's classroom teaching in the blended learning-based flipped classroom method. Responses were systematically quantified utilizing a Likert scale, where a score of 1 symbolized profound disagreement while a rating of 5 represented an intense level of agreement.

3. Result and Discussion

3.1.1. The result of validity of test items

The calculated coefficient values of V Aiken for all items fall within the range of 1.06 to 1.46, indicating that each item possesses substantial validity with a mean value of 1.31. This statistical finding confirms the commendable quality and suitability of these items as they correspond appropriately with their specific indicators; since the recorded Value Coefficient surpasses the threshold value (0.811) for an acceptable deviation in Aiken's Index at a marginal error rate of five percent. Thus it can be inferred that these particular components exhibit considerable efficacy in quantifying pertinent factors which aligns precisely with their designated roles; accordingly substantiating this tool's capability in discerning prerequisite measurements and further authenticating its selection for utilization thereof.

3.1.2. The result of reliability of test items

The researcher can determine whether the test's two halves measure the same features or attributes by looking at split-half reliability. The reliability coefficient was determined by the researcher with Spearman-Brown formula.

Using this method, the researcher discovered that the test's reliability coefficient was 0.834. Reliability is generally recommended to be at least 0.70, and preferably, it should be higher than this criterion, according to approved research

norms.

3.1.3. The questionnaire's validity and reliability results

Cronbach's Alpha was calculated as 0.882, with a significance of 5% at 0.308. The reliability was deemed high since 0.882 exceeds 0.80.

3.1.4. The result of normality test

The researchers employed the Shapiro-Wilk test as a method to evaluate data normality. Should the significance value exceed 5% ($\alpha > 0.05$), it can be concluded that the dataset follows a normal distribution pattern.

Table 1. Tests of normality

	Class	Shapiro-Wilk		
		Statistic	df	Sig.
Students' Score	Pre-test (Experimental)	.968	25	.596
	Pre-test (Control)	.963	25	.475
	Post-test (Experimental)	.951	25	.264
	Post-test (Control)	.961	25	.432

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The data aligns with a normal distribution, which is substantiated by the Shapiro-Wilk test's significance levels as delineated in Table 1. The values for all pre-test and post-test data within both the experimental and control groups are .596, .475, .264, and .432 respectively. These outcomes bolster validation of the null hypothesis (Ho).

3.1.5. The result of homogeneity test

The Levene Statistic is used to examine variance equality among different samples. Based on the mean, the significance level (Sig.) is 0.364. The alternative hypothesis (Ha) is rejected since this value is greater than $\alpha = 0.05$. The reading comprehension achievement statistics for the students in the experimental and control groups appear to be homogeneous in their variances, based on this observation. Since homogeneity of data variance is often seen as a prerequisite, the independent samples t-test is pertinent. After the data's homogeneity and normality were confirmed, a hypothetical test was run to see whether the study's goal of doing research had been achieved.

Table 2. Test of homogeneity of variance

		Levene			
		Statistic	df1	df2	Sig.
Students' Score	Mean	.840	1	48	.364
	Median	.663	1	48	.419
	Median and with adjusted df	.663	1	47.982	.419
	Trimmed mean	.838	1	48	.364

3.1.6. Result of statistic differences between post-test experimental and control class

Table 3 delineates a disparity in the mean value between the experimental cohort ($M = 76.92$, $SD = 5.604$) and the control group ($M = 66.72$, $SD = 5.079$). To investigate with precision

whether these two classes express significant variances regarding test performance, an independent-samples t-test was carried out employing an alpha level of significance at 0.05. This outcome is further elaborated upon in the subsequent table.

Table 3. Group statistics between post-test experimental and control class

Class	N	Mean	Std.		
			Deviation	Error Mean	
Post_Test	Experiment	25	76.92	5.604	1.121
	Control	25	66.72	5.079	1.016

3.1.7. Result of independent sample test of experimental and control class

A marked discrepancy can be substantiated between two classes if the significance level, represented as a sig. (2-tailed) value, equates to or falls below 5% or 0.05. It is evident that the experimental class surpassed the control class in terms of reading comprehension, with specifications defining $t = 6.743$, degrees of freedom equaling 48 and probability value (p) registering at .000 within a confidence interval spanning from 7.159 to 13.241 at the confidence level of ninety-five percent. The decipherable clarity from the sig.(2-tailed) predicates p-value is lower than five percent upon comparison ($.00 < .05$). Thus, given this evidence corroborated by statistical analysis we confer relevance on the t-value deemed significant at a threshold proportioned by five percent. This holds implications for an inherent disparity in educational attainment evaluated during post-experiment assessments contrastingly executed between both experimental and control classes. The outcomes determined from the application of the t-test reveal that the t-test results for the control class stand at $M=6.500$, Std. Deviation= 8.98494 , Std. Error Mean= 1.79699 , and Sig. (2-tailed) = 0.001, while t-test results of experiment class are $M=16.000$, Std. Deviation= 8.56957 , Std. Error Mean= 1.71391 , and Sig. (2-tailed) = 0.000. Based on the provided information, it can be affirmed that the alternative hypothesis (H_a) is validated. The aforementioned hypothesis posits that a blended learning-based flipped classroom method holds superior efficacy in enhancing reading comprehension among tenth graders at SMAN 5 Palembang. Prior to confirming this hypothesis, the t-test was employed to juxtapose the means of both experimental and control classes. Subsequently, evidence corroborated that performance levels were notably higher for students in experimental classes compared to their counterparts in control classes, with an unequivocal significance value: 0.000% versus 0.001%.

3.1.8 The result of the effect size of blended learning based flipped classroom

The mean post-test scores for the experimental group and the control group, as presented in Table 3, were 76.92 and 66.72 respectively, with standard deviations of 5.604 and 5.079. Subsequently, the effect size was computed using Cohen's d , employing the following formula:

$$\text{Pooled Standard Deviation: } \frac{5.604+5.079}{2}$$

$$\frac{10.683}{2} = 5.3415$$

$$(d) = \frac{(\text{mean of group A} - \text{mean of group B})}{\text{Pooled Standard Deviation}}$$

$$(d) = \frac{(76.92-66.72)}{5.3415} = \frac{10.2}{5.3415} = 1.9059$$

Based on the above calculation, the calculated effect size was 1.9059. This result was then compared to the Cohen's d effect size measurement criteria, and it fell within the strong effect ($1.00 >$) range. For this specific effect size index, Cohen appropriated the symbol " d " to categorize data into three distinct classifications: small (constructed at $d = 0.2$), medium (established at $d = 0.5$), and large (synthesized at $d = 0.8$). Ultimately, it was found that the employment of a blended learning strategy which incorporates a flipped classroom model, exerted a considerable influence on students' advancement in their reading comprehension abilities.

3.1.9 Students' perception of the blended learning based flipped classroom model teaching model

The secondary objective of this study sought to analyze student perspectives about the efficacy of a blended learning based the flipped classroom model, specifically regarding its impact on enhancing their reading comprehension achievement. Table 4 delineates distinct characteristics surrounding student perceptions towards this particular teaching paradigm embedded within a blended learning-based flipped classroom context.

Table 4. The mean scores of students' perceptions of the blended learning based flipped classroom teaching model

Items of Questionnaire	Mean	SD
I think that engaging in video-watching and note-taking is significantly contributing to my learning.	4.68	0.48
Due to the integration of blended learning and flipped classroom methods, my readiness for exams has notably enhanced compared to studying in traditional classroom settings.	4.60	0.49
I enjoy watching the website's video lessons. They are informative and offer useful advice.	4.92	0.28
I take my time watching the videos so that I can learn as much as possible.	4,80	0.41
It would be highly beneficial if a larger number of teachers utilized the blended learning-based flipped classroom method. This particular educational strategy not only fosters increased engagement, but it also enhances students' retention of pertinent information.	4.84	0.33

I pause or replay parts of the videos to ensure that I understand the material. This allows me to learn more efficiently.	4.68	0.48	a quick and easy way to learn more about a subject. This is due to the fact that we will be doing the majority of our learning in class while also receiving assistance from the teacher online.		
In the blended learning-based flipped classroom method, I am encouraged to use critical and creative thinking skills.	4.80	0.41	The blended learning-based flipped classroom method has been found to be more effective at promoting collaborative learning.	4.64	0.48
Preparing by studying fundamental content in advance enables me to comprehend the material more effectively during class.	4.68	0.48	The blended learning-based flipped classroom method enhances student engagement in the course, as active participation tends to stimulate interest among students.	4.76	0.44
Since adopting the blended learning-based flipped classroom method, I find myself asking more questions during class.	4.76	0.44	The blended learning-based flipped classroom method has empowered me to manage the pace of my learning. This affords me the opportunity to take control of my education, which is wonderful as it enables me to progress at my own speed and concentrate on topics that captivate my interest.	4.64	0.56
One technique to enhance teaching and learning is through the use of the blended learning based flipped classroom method. It's fascinating to see how learning and teaching occur in the blended learning-based flipped classroom method, and it inspires me to learn more.	4.76	0.44	The blended learning-based flipped classroom method classroom facilitates communication with fellow students in ways not achievable in a conventional classroom setting.	4.40	0.76
With the blended learning-based flipped classroom method, I must put in more effort in the classroom. This implies that, rather than sitting at a desk all day, I should be more active and engaged in our learning.	4.56	0.50	I prefer blended learning-based flipped classroom method to traditional lecture-based instruction because it allows me to learn material more effectively.	4.72	0.46
The utilization of blended learning based the flipped classroom method for teaching can offer benefits..	4.76	0.44	The blended learning based flipped classroom method is an excellent teaching method that I would recommend to a friend. It enables students to learn in a more hands-on manner and contributes to a more engaged and active learning environment.	4.40	0.76
The utilization of blended learning based the flipped classroom method can enhance the exploration of topics.	4.64	0.48	Because it corresponds to my natural learning style, I prefer to learn in the blended learning-based flipped classroom method setting.	4.40	0.71
After viewing the video content, I felt better equipped to accomplish the tasks assigned during the course sessions.	4.80	0.41	I believe that learning in the in the blended learning-based flipped classroom method has helped me achieve higher grades in school.	4.76	0.44
The blended learning based flipped classroom method allows students to learn in a more interactive manner. Because students are constantly interacting with the material, teachers can keep them engaged.	4.96	0.20	My interaction with my teachers was not hindered by the blended learning-based flipped classroom courses. I was able to communicate with them on a regular basis, just as if the course had been traditional.	4.40	0.71
In the context of the blended learning-based flipped classroom method, I find myself with considerably fewer opportunities to practice course concepts.	4.92	0.20	The blended learning-based flipped classroom method have helped me improve my understanding of course content, and I believe they would benefit others as well.	4.56	0.65
The blended learning-based flipped classroom method facilitates the comprehension of fundamental subject matter.	4.96	0.20	As I have been using the blended learning-based flipped classroom method, I've become less reliant on teachers.	4.48	0.51
The blended learning-based flipped classroom method is a superb instructional method for my field of expertise. It provides content outside of class while also encouraging problem solving in class.	4.88	0.28			
The blended learning-based flipped classroom method is	4.76	0.44			

Perceptions of flipped classroom	4,69	0,14
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Table 4 shows that there is a high degree of agreement for items 3, 15, 16, and 17. $M = 4.92$, $SD = .28$; $M = 4.96$, $SD = .20$; $M = 4.92$, $SD = .20$; $M = 4.96$, $SD = .20$. The overall mean perception of the flipped classroom paradigm is ($M = 3.74$, $SD = .608$), as the table illustrates.

3.2. Discussion

The findings show that students who were exposed to the blended learning-based flipped classrooms outperformed their peers in conventional learning setting. The null hypothesis was rejected since the statistical analysis showed a substantial advantage ($p < .05$) for the experimental group over the control group.

Due to readily available resources and amenities, students in the blended learning-based flipped classroom exhibited heightened motivation toward learning. This discovery aligns with previous studies indicating that the blended learning-centered flipped classroom enhances motivation. Not only did students display eagerness to learn, but they also conveyed contentment with their acquired knowledge. In fact, the experimental group surpassed the control group in their post-test performance, potentially attributed to the learning environment facilitated by the blended learning-based flipped classroom method [46] [47] [48] [49].

Regarding interaction, the blended learning-based flipped classroom method outperforms traditional lecturing. It emphasizes the value of set apart time for learning and encourages participation through teacher-student interactions, peer support, and cooperative effort. The researchers observes that students engage actively in discussions, hands-on activities, problem-solving tasks, and collaborative projects during class sessions within the blended learning-oriented flipped classroom. Leveraging their prior knowledge enables students to participate more effectively, thus enriching the learning environment's effectiveness.

The main distinction between the blended learning-based flipped classroom and the traditional classroom is the timing of content intake. Students individually access and study the content before to class, at their own pace, and in a location of their choice, using the blended learning-based flipped classroom paradigm. In contrast, during class sessions, students in traditional classrooms adhere to the teacher's schedule and pace for the delivery of content. The substantial cognitive engagement seen in this study may have been influenced by the extra time flipped classroom teachers gave their students to examine the content and apply pertinent prior knowledge before class. This encounter involved the processing of detailed information and the application of higher-order cognitive skills.

The results of the study show that students in flipped classrooms with a blended learning focus engaged in more meaningful and related interactions than their counterparts in regular classrooms. These results are consistent with a study that looked at how the flipped classroom method, which combines blended learning and content-based learning,

affected students' cognitive abilities. The discourse of second language learners in both traditional classes and blended learning-based flipped classrooms was examined in this study. According to comprehensive quantitative and qualitative research, it has been observed that students engaged in a blended learning method, specifically within a flipped classroom environment, demonstrated a greater propensity for advanced cognitive engagement. This involves deep information processing along with the utilization of advanced critical thinking abilities [50].

The second aim of the study is to evaluate how students perceive blended learning based the flipped classroom method. The 30-item Likert-scale questionnaire with five points was used for this. The majority of students who responded concurred that the blended learning-based method of flipped classrooms works well. Surprisingly, 98 percent of students said that this method is more interesting and enhances reading comprehension than the typical classroom method. Students also underlined how the blended learning-based flipped classroom method provides more opportunities for group sharing and discussion, which aids students in effectively resolving assignment challenges.

In the blended learning-based flipped classroom, most students reported having more possibilities for group problem-solving during in-class tasks. This is consistent with social interdependence theory, which holds that how people structure their goals affects how they relate to each other. Collaborative learning methods contribute to cultivating favorable social interdependence, marked by cooperative endeavors among group members. Positive social interdependence among students can be fostered in a classroom setting by using the method of flipped classrooms inside the blended learning-based flipped classroom framework, according to some research [51] [52].

Moreover, based on the idea that students learn best when they take responsibility for their own academic progress, students feel that the blended learning-based flipped classroom promotes a proactive method to education. By using this method, students can learn through active engagement with the content and application of concepts under the direction of the teacher. Most students claim that the blended learning-based method of instruction encourages self-directed learning and problem-solving, which fosters greater engagement with the learning process [53] [54] [55].

4. Conclusion

The primary findings indicated a substantial improvement in students' reading comprehension outcomes, accompanied by a favorable perception of the blended learning-based flipped classroom method. Data from questionnaire revealed that a majority of students acknowledged the advantages of integrating technology within this approach. Additionally, pre-classroom activities were noted to enhance readiness for subsequent class sessions, while in-classroom activities offered benefits such as review sessions and collaborative learning experiences. Moreover, the method contributed to

increased student engagement, proactive learning, and the ability to overcome academic challenges.

For future research enhancement, the researcher suggests conducting a more comprehensive investigation into students' viewpoints on the blended learning-based flipped classroom method. This would entail investigating factors such as students' attitudes and motivation, as well as investigating additional variables that may influence students' reading comprehension but were not covered in the current study. Furthermore, future researchers should include a control group to detect any differences. Subsequent research should include previously unexplored variables such as gender and parents' educational backgrounds. It is crucial to ensure that the films utilized in implementing the blended learning based flipped classroom method are easily comprehensible to every participant or student involved. It is essential for teachers to ensure that the videos effectively aid comprehension for each student.

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